Vol. 76, No. 8 October 25, 1943

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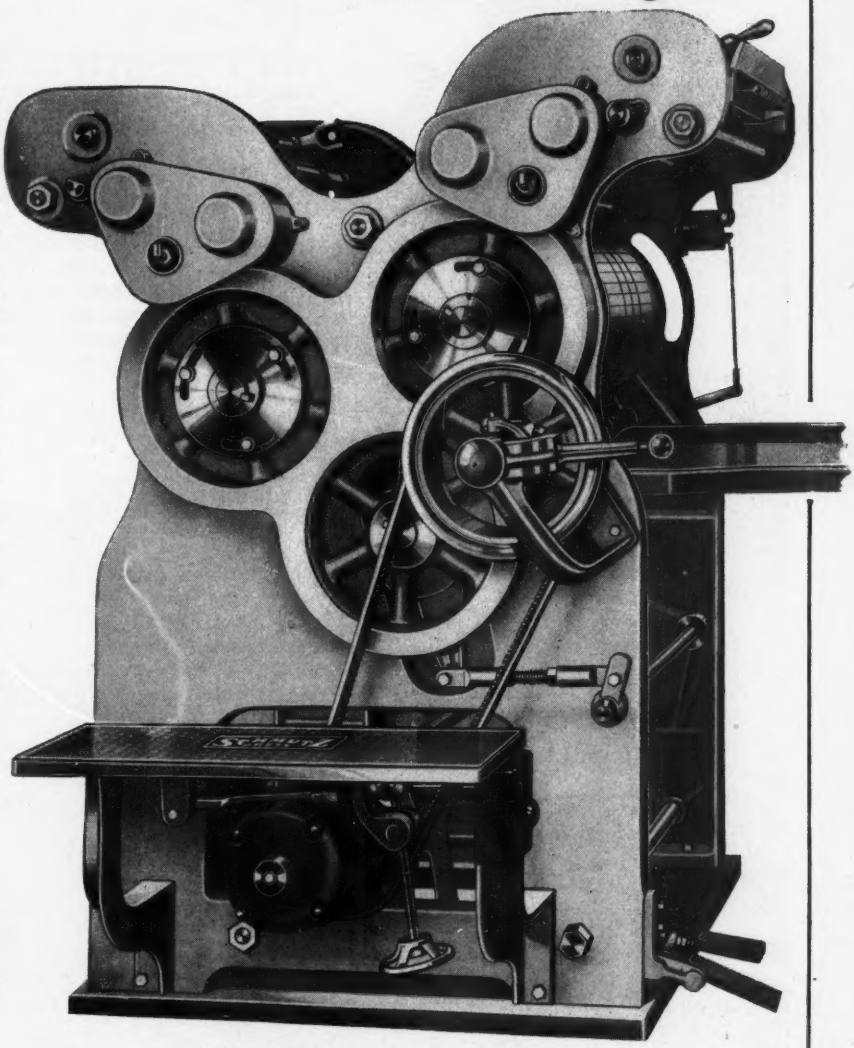

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The American FERTILIZER

Vol. 109 OCTOBER 30, 1948 No. 9

Some Fertilizer Problems from the Indusy Point of View

By Vincent Sauchelli

Director of Agricultural Research, The Davison Chemical Corporation, Baltimore, Md.

I would like to discuss briefly a number of problems in which fertilizer men, chemical control officials, and agricultural workers have a common interest.

We of the fertilizer industry consider commercial fertilizers as essential aids in the development of any permanent system of land conservation and improvement. Our chief service to the community is to supply abundantly and at low cost the raw elements which are capable of restoring and maintaining the productivity of the land: to make poor land good, and good land better. Fertilizers are indispensable, whether it is to grow a heavy cover crop to keep top soil in place and to improve it, or to raise commercial crops of high cash value in a permanent system of cropping. No matter how rich a soil may have been in its virgin state, if it is cropped year after year under present day commercial systems, it is necessary sooner or later to apply all the major and some of the minor plant nutrients. Otherwise, crop yields cannot be maintained at a profitable level. In fact, the concept of "minor" element is no longer tenable: any one of the plant nutrients can become of major importance if it is seriously deficient in the soil. The trend throughout most of the Gulf and Coastal Plain is to apply fertilizers containing from 4 to 7 plant nutrients, exclusive of lime and sulphur.

* A paper presented at the Conference of Fertilizer Manufacturers and Agricultural Agencies, Biloxi, Mississippi, October 29, 1948.

Fertilizers have become of world-wide importance. Never have they been so important to the world and to American farmers as they are today. In our country they account for about 20 per cent of the total crop. In some of the southern states the portion is closer to 50 per cent. In other states, notably in the North Central Region, the portion is least, but the status is changing rapidly due to the expanded acreage of hybrid corn and soybeans. Farming in this country last year consumed close to 17 million tons of fertilizers, of which about 11 million tons comprised complete fertilizers. It also consumed about 16 million tons of lime. These are huge quantities and they represent by no means the total potential.

Farm Problems of the South

It was not so long ago that agricultural workers based their theory of fertilizer use on the basis of soil needs exclusively; today the emphasis is increasingly being put on crop needs as determined by plant chemistry and plant tissue tests and nutritional values. I believe that ultimate nutritional value of the crop to be grown is going to become the determining factor in the future. Generally speaking, the emphasis on crop production has been on dollars and profits. There is nothing wrong with that emphasis, of course. But we must not ignore nutritional value and we may just as well start emphasizing it along with gross yields.

Fertilizers have always played an import-

ant role in southern agriculture. They are bound to continue to do so and perhaps on a more intensive basis. Dr. M. J. Funchess of Alabama is recongized by us all as one who is thoroughly familiar with the farm problems of the South and has done a lot of hard thinking on how to solve these problems. At the last Southern Agricultural Workers Convention he discussed these problems. I want to recall to you some of the things he emphasized because they have a bearing on fertilizer practices. The fundamental farm problem of all southern states, he said, is the low per capita income of their farmers. In the main, low production per acre, low production per day's labor and too few acres in commercial agriculture are the major problems of southern agriculture. Economic production he said, and not just increased production alone, must be the major goal.

Low Production Per Acre in the South

Farming must become more of a business and less of a social institution, here and eslewhere, if it is to carry out its function in our economy. From this point of view, the cost of producing a crop is of prime importance. In this cost picture the amount of labor used and the yield per acre largely determine the profit. The average yield of corn per acre in the 4 southern states (Georgia, South Carolina, Alabama and Mississippi) as given by Dr. Funchess for the 3-year period ending in 1946 was 16 bushels. It was 48.8 bushels in the 4 midwest states of Ohio, Indiana, Illinois, Iowa. These same 4 southern states averaged per acre 92 bushels of sweet potatoes and 309 pounds of cotton. These yields are too low. Dr. Funchess also reported that the labor charge against 100 bushels of corn in these 4 southern states in 247 hours as against 46 hours in the midwest states.

These are hard facts and undoubtedly are root causes of the low cash per capita income of southern farm people.

Can yields be increased? They can. The evidence at each of the agricultural experiment stations in these 4 southern states gives the affirmative answer. Many individual farmers also report much higher yields. one of the important factors in this improvement of yields is the use of plant nutrients at higher rates. Other factors are also important, such as improved seed, better farm machinery, more efficient contol of insects, diseases and weeds. But fertilizer is the factor that dominates because, without it and soil management, high profitable yields cannot be sustained year after year.

That is briefly what I consider the job and the opportunity we in the fertilizer industry have in the South to serve and to help farmers solve their main economic problems.

In supplying fertilizers, certain difficulties in manufacturing and selling develop which involves us more or less with the State Inspection Service. In the last three or four years circumstances beyond our control have tended to make these problems somewhat more difficult. If we can exchange ideas regarding these problems and discuss them with all candor, I feel we all shall be the gainers. I freely acknowledge that officials in chemical control work have always been fair and tolerant in their dealings with our industry. The fact that we are in conference here at this time reflects the friendly relations which have developed among us.

It is always helpful to discuss one's problems with others who have a sympathetic understanding of them. My review of these problems is for the purpose of developing a better understanding of them among us and is in no sense an alibi. I shall show that a sincere effort is being made by industry to do something about them.

Sampling

Sampling and analysis go together: one suggests the other. Methods of analysis have, generally speaking, been ironed out and a highly satisfactory situation exists, even though technicians are still trying to work out methods for analyzing the less common elements. Sampling is something else.

The production executive in the fertilizer plant and the control officer in the State Inspection Service have each a responsibility in improving the work of sampling. The laboratory can pass judgment only on the sample submitted. No analysis can be better than the sample. In fact, a poor sample is worse than no sample at all. Failure to give sampling proper consideration leads to the unexplainable variations in the quality of the goods, difficulties in manufacturing, possible strained relations between manufacturer and control officials and finally to dissatisfied customers. Sampling is not a job that can be assigned to any one. It should be done by a thoroughly trained, intelligent worker. That goes for the inspection service of the State as well as the fertilizer plant.

The fertilizer manufacturer has every reason for living up to guarantees of his product. There is no personal motive to do otherwise, especially in corporations, because there is no personal gain. If the guarantee is

deficient, the reason is to be found, in most cases, in manufacturing difficulties and not in any intent to defraud. Mr. D. S. Coltrane of North Carolina recently pointed out that in his state farmers have received over $7,000,000 in extra fertilizer value above guarantees during the past 7 or 8 years. Averages of a similar kind are known to have benefitted farmers in other states. Nevertheless, there are cases of deficiency. I recall that, in the last report of Commissioner Corley on analyses of fertilizers sold in Mississippi in 1947, 73 samples or about 8 per cent of the total showed deficiencies and penalties in the amount of about $20,000 assessed. However, at the same time 822 samples were not deficient. The record shows that a large number of the companies had a perfect record, that is, no deficiencies. My remarks on industry problems apply to the picture as a whole and not to any specific state.

At the last meeting of the Association of Southern Feed Control Officials meeting in Asheville, N. C., Mr. E. W. Constable of the North Carolina Department of Agriculture reported on comparative procedures in the sampling of fertilizers for analytical purposes. The next result of his study was that present procedures in sampling give results of wide variation. He used three types of samplers: (a) single half-tube; (b) double-tube or Indiana, sampler; and (c) a single, slitted-tube, i. e., one tube out of an Indiana double-tube sampler. His conclusion was that much additional work is needed before one can say definitely that one procedure is better than another.

Dr. H. R. Allen of the Kentucky Agricultural Experiment Station reported at the same meeting on sampling problems. Dr. Allen showed that the type of sampler used is not uniform throughout the country although the trend is toward the double-tube sampler. In some states the sampler mixes and quarters the sample when taken and sends only a part to the laboratory; in other states the whole sample is sent to the laboratory. Some use paper or paste-board containers, others use glass containers, cotton bags, or metal containers.

The problem of sampling is even more difficult in the case of granular fertilizers and double-strength goods, and lately the sampling of anhydrous ammonia for direct application has introduced other problems. The inclusion of weed killers and insecticides in mixed fertilizers is going to make sampling increasingly difficult.

Problems in Mixing

The producer has many problems in his mixing operation. One of the difficulties is in getting the raw materials one prefers to use. This is practically impossible today. One has to accept what he can get, and like it. The quality of labor available does not help matters. Competition for labor at present is very strong. Fertilizer operations, being dusty and dirty, do not attract the better class of workman. Fertilizer is a comparatively low-cost commodity and this fact restricts the manufacturer in the wage he can afford to pay. If fertilizers were high priced commodities, the producer could do a lot of things which are prohibitive now.

Let us review some specific items. Generally speaking, a complete fertilizer comprises a mixture of diverse materials of varying particle sizes and densities. No matter how thoroughly one may mix them, segregation cannot be avoided. The superphosphate is more or less powdered if ordinary run-of-pile; if some treble is used also, this is more likely granular. The nitrogen carriers may be light bulky materials or most likely they will be in the form of solutions or granular. The potash salts most likely are semi-powdered and, if in the form of manure salts, have a strong tendency to absorb moisture and to cake. Mix these materials thoroughly and what happens? The lighter and finer particles tend to segregate from the coarser ones. The industry could grind them all to a fine powder to secure uniformity, but the farmer won't take it, because of the difficulty of handling it in the field, as it is not freely drillable. Samples taken of mixtures of this kind from the pile or from individual bags will not be uniform, principally because of segregation When batches are dumped into the bin, conical piles form and the coarser particles roll down the sides and to the bottom. The same thing happens in filling bags. Sample cores taken through the middle of the bag can and do vary in analysis from cores taken from the sides.

High-analysis versus Normal Grades

The trend is toward a higher content of plant food in mixed fertilizers. According to K. D. Jacob of the U. S. D. A., the average content of plant nutrients of commercial mixed fertilizers increased from 13.9 per cent in 1900 to 21.65 per cent in 1945,—roughly, a 56 per cent increase. This increase corresponds with the period during which synthetic nitrogen products were gradually displacing

(Continued on page 28)

Program for N. F. A. Fall Meeting

The program for the 22nd Fall Meeting of the National Fertilizer Association at Atlanta, Ga. on November 15th, 16th and 17th, will feature eight talks on important departments of fertilizer work, including such timely subjects as increased production, labor problems, broadening the fertilizer market, TVA developments, better pasture fertilization. The general sessions will be held on the mornings of October 16th and 17th, the opening day being devoted to meetings of the Board of Directors and other committees.

The Atlanta gathering will be the first meeting of the Administration of Dr. Russell Coleman, the new N.F.A. president, who will make the opening address of the Wednesday session.

The program for Tuesday includes:

Opening Address: Ray King, chairman of the Board of Directors, The National Fertilizer Association.

"Increased Production—Master Weapon in the Fight for Freedom," Clem D. Johnston, president, Roanoke Public Warehouse, Roanoke, Va.

"Nitrogation, Nitrojection and Soil Fumigation—Their Application and Results," E. H. Leavitt, Technologist, Agricultural Department, Shell Chemical Corporation, San Francisco, Calif.

"Tomorrow's Labor Problems," Ray M. Suter, director of industrial relations, Ohio.

The Annual Industry Dinner will be held on Tuesday evening, November 16th, with C. T. Prindeville, vice-president of Swift & Co., presiding.

Wednesday's addresses are as follows:

"Broadening the Fertilizer Market," Dr. Russell Coleman, president, The National Fertilizer Association.

"The Test of Time," Dr. Firman E. Bear, professor of agricultural chemistry and head of the soils department, Rutgers University, New Brunswick, N. J.

"The Tennessee Valley: A Regional Demonstration in Soil Fertility Conservation," Gordon Clapp, chairman of the Board, Tennessee Valley Authority, Knoxville, Tenn.

"The Need for More Adequate Fertilization of Pastures," Dr. C. C. Murray, director, Georgia Agricultural Experiment Station, Experiment, Georgia.

Ray King, chairman of the Board of Directors, will preside at both of the general sessions.

Army Ammonia For Four Fertilizer Plants

The U. S. Department of Commerce announced October 22 the allocation of 194 tankcars of Army produced anhydrous ammonia, to be shipped during the last three months of this year to four fertilizer plants, which otherwise would be forced to suspend or curtail operations for lack of this material.

The quantity made available to each of the four companies represents the minimum of anhydrous ammonia required to keep the plant in production of ammonium sulphate, according to officials of the Office of Domestic Commerce. The 194 tankcars will move 5,044 tons of anhydrous ammonia, having a nitrogen content of 4,154 tons.

The four companies are: Farm Service Company, Oakland, Calif.; A. F. Pringle & Co., Charleston, S. C.; Greenville Chemical Company, Greenville, Miss., and Columbia Metals Company, Seattle, Wash.

Officials of the ODC said that after providing for these four preference cases, approximately thirty-two tankcar loads of Army anhydrous ammonia remain to be distributed among domestic fertilizer producers. Under distribution order D-1, this balance will be made available to primary producers of nitrogen, in proportion to their participation in the civilian export program. This distribution will be made as soon as the required information is received from eligible producers.

Phosphate Committee Discusses Western Leasing Regulations

A subcommittee on western phosphate of the Minerals Advisory Council has been appointed to consult with the Department of the Interior on the provisions for leasing western phosphate lands for development.

The committee is composed of George A. McHugh, Simplot Fertilizer Company, Chairman; T. C. Russell, Anaconda Copper Mining Company; William Anderson, Anderson Phosphate Mining Company; Duard C. Ray, Phosphate Mines, Inc.; G. W. Bunting, Central Farmers Fertilizer Company, and Kenneth Ray, Westvaco Company.

A meeting of the committee with Assistant Secretary of the Interior C. Gerard Davison was held at Pocatello, Idaho, on October 22nd at which time revision of the leasing regulations was discussed. These revisions follow a pattern suggested at an earlier public hearing on August 31st.

Annual Meeting of Middle West Soil Improvement Committee

C. J. Cahill of the Rath PackingCompany, Waterloo, Iowa, was re-elected president of the Middle West Soil Improvement Committee at the organization's annual meeting at the Palmer House, Chicago, Ill, on Thursday, October 28th.

B. C. Manker, Michigan Fertilizer Co. Lansing, was re-elected vice-president. W' B. Copeland, Smith-Douglass Co., Streator. Ill., was named treaurer to succeed E. O., Kintzing of Swift & Company, Chicago.

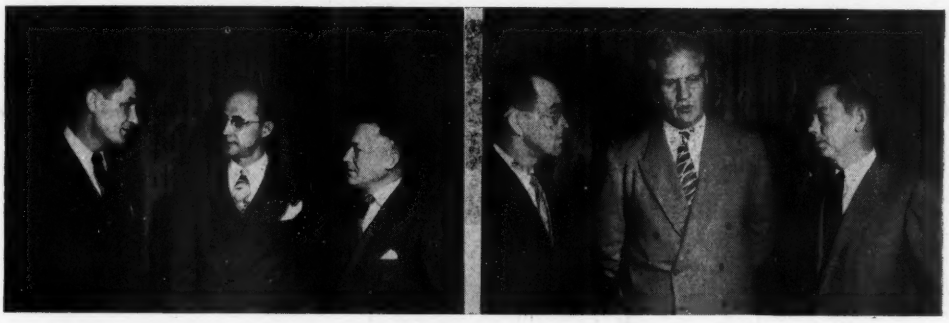
New members of the board of directors elected were: H. E. Balbach, Swift & Company, Hammond; J. D. Lanter, Illinois Farm Supply Co., Chicago; J. D. Stewart, Jr., Federal Chemical Co., Louisville, Ky.; and Nelson T. White, Smith Agricultural Chemical Co., Columbus, Ohio. They succeed returing board members C. P. Bond, Baugh & Sons, Canton, Ohio; A. R. Mullin, Indiana Farm Bureau Coop., Indianapolis, Ind.; A. J. Darfus, Virginia-Carolina Chemical Co., Cincinnati, O.; and E. O. Kintzing.

Nearly 100 industry men representing 39 member companies in the Middle West and guests were present.

Progress reports on the committee's educational activities were presented by various committees and plans for additional projects were discussed.

The membership committee, headed by W. B. Copeland, stated that seven new members have been added during the past year. Among the new members introduced at the meeting were W. W. Venable, Pocahontas Fertilizer Co., Pocahontas, Iowa and R. J. Fleming, National Fertilizer Co., Des Moines, Iowa.

Z. H. Beers, executive secretary of the committee reported an expansion of educational publicity work. A greater volume of information on soil improvement and land management methods is being supplied to newspapers, farm magazines and radio stations, he said. Beers added that 360,000 copies of a new color folder on hunger signs prepared by the committee have already been distributed by member companies to farmers, county agents, fertilizer dealers, agricultural extension workers and vocational agriculture teachers in the Middle West. The committee, he said, is set up to cooperate with the land-grant colleges and agricultural experiment stations in furthering the spread of good soil fertility and land management practices among farmers in the Corn Belt area.



OFFICERS AND DIRECTORS OF THE MIDDLE WEST SOIL IMPROVEMENT COMMITTEE
Left to right, H. E. Balbach, Swift & Company, Director; J. D. Lanter, Illinois Farm Supply Co., Director; C. J. Cahill, Rath Packing Co. President; Z. H. Beers, Executive Secretary; Dan Williams, Minnesota Farm Bureau Service Co., Director; J. D. Stewart, Jr., Federal Chemical Co. Director

Plans are now being made for a second annual Joint Meeting of College Agronomists and Soil Men with representatives of the fertilizer industry. The soil scientists will report on the research work in soil fertility and land management which they consider most significant.

A tentative date of February 18, 1949 has been selected for this meeting. Last year, more than 150 college men and industry executives attended and took part in the discussions.

The information brought out in meetings of this kind is of benefit to both the scientist and to the fertilizer production man. Further details of the program will be announced later.

THE AMERICAN FERTILIZER

ESTABLISHED 1894

PUBLISHED EVERY OTHER SATURDAY BY
WARE BROS. COMPANY
1900 CHESTNUT ST., PHILADELPHIA 3, PA.

A Magazine international in scope and circulation devoted exclusively to the Commercial Fertilizer Industry and its Allied Industries

PIONEER JOURNAL OF THE FERTILIZER INDUSTRY

A. A. WARE, Editor
K. F. WARE, Advertising Manager

ANNUAL SUBSCRIPTION RATES

U. S. and its possessions, also Cuba and Panama	$3.00
Canada and Mexico	4.00
Other Foreign Countries	5.00
Single Copy	.25
Back Numbers	.50

Vol. 109 OCTOBER 30, 1948 No. 9

Principal Articles in This Issue

California Fertilizer Association Celebrates Silver Anniversary

The California Fertilizer Association held its 25th annual convention at the Mission Inn, Riverside, California, on October 18th and 19th. The meeting was attended by almost 300 members and guests who thoroughly enjoyed two full days of business and pleasure which had been arranged by the Convention Committee.

Officers elected for the coming year were: Earl R. Mog, president; J. M. Quinn, vice-president; Paul Pauly, secretary; Grover C. Dunford, treasurer; Oliver E. Overseth, executive secretary and manager.

The meeting program, as well as that of the Soil Improvement Committee, included a number of short addresses which permitted many important phases of fertilizer work to be covered.

Allen B. Lemmon, chief of the California Bureau of Chemistry, gave a report on the work of the control office during the year; W. E. Martin, extension specialist in soils, discussed fertilizer tests with nitrogen and phosphorus on growing small grains; and E. S. Wallihan, Citrus Experiment Station, spoke on "Radioactive Phosphorus As a Tool in Plant Nutrition."

Oscar A. Lorenz, professor of truck crops, enlightened the group on his interesting fertilizer placement work with vegetable crops, expressing the opinion that some previous work did not show beneficial results from phosphorus because the phosphorus was not placed in close proximity to the seed.

L. D. Batchelor, director of the Citrus Experiment Station at Riverside, who welcomed the group, discussed the disease "quick decline." He stated that his staff was studying possible insect carriers and types of root stock resistant to this disease.

Wallace Macfarlane, president of CFA, traced the development of California agriculture for the past 25 years, giving statistics on crop acreage and yield. Quality and quantity essential to Western growers' crops was the topic presented by C. B. Moore, secretary and manager of the Western Growers Association, and the same subject as it relates specifically to citrus was presented by F. R. Wilcox, assistant general manager of the California Fruit Growers Exchange. Prof. Hans Jenny, University of California, reviewed his work on the fertility levels of California soils.

A. D. Shamel reviewed 50 years of observations of fertilizer practices. C. T. Prindeville,

vice-president, Swift & Company, discussed activities of trade associations, giving illustrations of different worth-while activities of such organizations. M. E. McCollam, of the American Potash Institute reported on the year's activities of the Soil Improvement Commmittee.

George D. Scarseth, director of research, American Farm Research Association, called attention to the fact that the organic-matter content of our soils is declining and that in most localities we are not yet returning, in fertilizer, the amount of nutrients removed by our crops.

At the luncheon on October 19th, A. D. Johnson, secretary-manager, Los Angeles Credit Managers Association, addressed the group on "Credit Implications." Also, F. S. Lodge acting president of the National Fertilizer Association told briefly of new projects being carried out by NFA.

The evening's entertainment was provided by Balfour-Guthrie & Co., Ltd. on the 18th and by the American Potash & Chemical Corporation on the 19th.

Weller Noble, of the Pacific Guano Co., was master of ceremonies at the Silver Anniversary Banquet. After he had introduced the honored guests and the charter members of the Association, Mr. Noble presented Horace Dunbar, first chairman of the California Soil Improvment Committee, who reminisced on the history of the fertilizer industry in California.

Coltrane Warns Against Claim of "Colloidal Availability"

North Carolina Agriculture Commissioner D. S. Coltrane has issued a warning to farmers and farm supply dealers not to be misled by claims made for some lime phosphate materials advertised as containing high percentage of "phosphoric acid (colloidal availability.)"

Registration of such products for sale in North Carolina has been repeatedly refused by the Department of Agriculture when they were offered under guarantees specifying "colloidal availability," Commissioner Coltrane said, explaining that the state laws regulating fertilizer and lime sales do not recognize such a term.

"Lime phosphate is a permissible material good for certain agricultural purposes," the Commissioner continued, "but dealers and farmers should not allow themselves to be misled by claims that it will accomplish the same thing for their crops as superphosphate.

"Advertising matter that has come to my attention for two brands of lime phosphate list in the analyses 20 to 23 per cent total phosphoric acid (colloidal availability). Our fertilizer and lime laws do not authorize the use of such a term, and laboratory analyses of various samples of these materials have shown that in most cases they contain only about two per cent of available phosphoric acid."

Dresser to Manage Summers' Canadian Plant

The Summers Fertilizer Company, Inc. of Baltimore, Maryland announces the appointment, effective November 1, of Walter E. Dresser of Calais, Maine as General Manager of its Canadian branch at St. Stephen, New Brunswick. Mr. Dresser has been associated with Summers in various capacities since graduating from Dartmouth College in 1930. He is the son of the late Willis R. Dresser who, with Walter P. Summers and James E. Totman, founded the Company in 1922. About a year ago Summers' St. Stephen plant was destroyed by fire. Rebuilding and installation of modern equipment will be completed as of November 1, 1948.

Mr. Dresser succeeds G. J. Campbell who has severed his connections as of November 1 with Summers and its subsidiary Companies.

Growing More Corn on Less Land

According to the Virginia Extension Service, corn acreage in the State has dropped nearly 500,000 acres or 31 per cent during the past 25 years. The average yield per acre has gone up more than 30 per cent during the same period. By using improved practices, Virginia farmers are now producing more corn on about one-third less land. Many farmers find it easily possible to produce 100 bushels of shelled corn per acre. In order to grow a corn crop, according to the Virginia authorities, a certain amount of plant food, such as calcium, phosphorus, potassium, nitrogen, magnesium, and certain minor elements, is needed. For a 100-bushel crop, which is a fair objective yield to work toward, it is pointed out that there will be a need by the crop for 140 lbs. nitrogen, 48 lbs. phosphoric acid, and 136 lbs. of potash. Virginia farmers, as well as those in nearby states, should read Virginia Extension Bulletin 99 if interested in higher and more economical corn yields.

International Promotes Meguschar and Stough

The appointments of Ben E. Meguschar as assistant to the vice-president of the plant food division and Joe F. Stough as northern general manager of the division have been announced by International Minerals & Chemical Corporation effective November 1, according to Louis Ware, president.

Mr. Meguschar joined the company in 1917 at Cincinnati as a salesman and has been serving as northern general manager of the plant food division for the past two years.

B. E. Meguschar J. F. Stough

He will become assistant to Maurice H Lockwood, who recently came to the company as vice-president and head of the plant food division.

Mr. Stough began his service with the company 23 years ago at Montgomery, Alabama, and has served as assistant district manager and later as manager of the Lockland, Ohio district for the plant food division. Since his return from the military service, he has been midwestern district sales manager for the potash division.

St. Regis Sales Meeting

The first annual sales meeting of the Multiwall Bag Division of the St. Regis Sales Corporation, subsidiary of St. Regis Paper Company, was held in the Hotel Waldorf-Astoria in New York on September 23 and 24 and brought together sales personnel of this division of the company from all sections of the country.

In two days of intensive presentation and discussion, broad consideration was given to the return of more normal competitive conditions and how they should be met; technical developments which are opening new vistas both in existing markets and new markets, and developments in the company's Engineering and Machine division which are resulting in new packer types that promise to extend mechanical packaging, with a resultant expansion in the utilization of the multiwall bag as a shipping container.

Arch Carswell, executive vice-president of St. Regis Sales Corporation and general sales manager of the Multiwall Bag Division of the company, conducted the two-day meeting. Actively participating were the five district sales managers of the division, V. C. Douglas, Burton A. Ford, J. F. Gruber, George P. Haberstein, Hugh W. Sloan and their entire sales staff.

Commenting on the fact that the multiwall sales effort no longer deals with a scarce commodity, as has been true for some years past, Mr. Carswell spoke of the need for a strong sales program now and stressed the part which sales promotion and advertising can play in the exploitation of new markets. He pointed to the wide list of commodities being packed or contemplated to be packed in multiwall bags.

Mr. Carswell referred to the substantial

(Continued on page 26)

FERTILIZER MATERIALS MARKET

NEW YORK

Supplies of Chemical Nitrogen Materials Shorter Than Ever. Some Producers Behind on Deliveries. Greater Demand for Organics from Feed Fertilizer Markets. Government Export Orders Absorbing Excess Superphosphate Supplies

Exclusive Correspondence to "The American Fertilizer"

NEW YORK, October 27, 1948.

Sulphate of Ammonia

With nitrogen solutions in short supply, many buyers were trying to increase their purchases of sulphate of ammonia but producers were all under contract for their next season's production.

Nitrate of Soda

Importers continue to bring boats to various ports from Chile and the material is shipped out about as fast as it arrives, against previous allotments. Demand continues good, for both domestic and imported grades.

Ammonium Nitrate

There is considerable inquiry for Ammonium Nitrate from various buyers and one large producer has been affected by a power shortage and forced to curtail production.

Nitrogen Solutions

Some of the producers are behind on deliveries and the supply in some sections is short. Little relief is looked for over the next month or two.

Nitrogenous Tankage

Buyers are taking delivery against previous contracts and with the approach of the heavy mixing season it is expected shipments will increase.

Castor Pomace

Producers are shipping on contract and it is possible the production may be cut down, due to the poor castor oil business. Most buyers have covered their requirements whenever possible.

Organics

Blood was scarce for prompt shipment and both fertilizer and feed buyers paid $8.00 per unit of ammonia ($9.72 per unit N) freely, f.o.b. various shipping points, and the market was well sold up. No South American was available on account of high asking prices in South America. Animal tankage sold at $7.25 to $7.50 per unit of ammonia ($8.82 to $9.12 per unit N) and while the fertilizer people showed little interest at these prices, the feed trade was willing to pay current prices for shipment over the next 60 days. Linseed meal was steady in price at around $59.00 per ton, f.o.b. Minneapolis, but most buyers were buying on a hand-to-mouth basis. Cottonseed meal was slightly firmer in price and the demand came mainly from feed interests. Soybean meal was slightly higher in price than the low point reached about three weeks ago and some trade authorities seem to think the price will gradually work higher.

Fish Meal

With the fishing season about over in most sections, available stocks were low and the feed trade was taking available offerings. It is considered likely this market will show a firmer tendency with the end of the fishing season.

Superphosphate

The production continues heavy in most producing areas but some Government export orders have been placed which should bring the productions more in balance with actual needs.

Potash

Most buyers would like to increase their supply of this material but, with no further word of any imported offerings, there is little likelihood that they will be successful. Demand continues heavy from most sections.

CHARLESTON

No Improvement in Nitrogen Supply Situation. Superphosphate Stocks Adequate. Offerings of French Potash Reported

Exclusive Correspondence to "The American Fertilizer"

CHARLESTON, October 25, 1948

Organics.—The demand for organics continues extremely quiet. Domestic nitrogenous can probably be obtained at figures from $3.50 to $4.00 per unit of ammonia ($4.25 to $4.86 per unit N), f.o.b. producers factories.

Castor Pomace.—There has been no change in this situation and shipments are being made on the old contracts, with no new material being quoted.

Dried Ground Blood.—The market on blood is very much stiffer, ranging from $8.00 to $8.25 per unit of ammonia ($9.72 to $10.02 per unit N), f.o.b. Chicago; all of it is going to feed.

Fish Scrap.—There is an insistent demand for acidulated fish from some manufacturers, but no material is being offered.

Cyanamid.—Producers are having difficulty delivering on contracts because of the shortage of electric power in Canada.

Potash.—It is reported that the French Syndicate is now offering muriate of potash at 95 cents per unit of K_2O, in bulk, c.i.f. Savannah and Norfolk shipment, seller's option, November May.

Phosphate Rock.—The market on this is easy and buyers are not having any difficulty in getting shipments on contracts.

Superphosphate.—Stocks remain fairly heavy in some areas and some manufacturers are having difficulty with storage problems.

Sulphate of Ammonia.—This is probably the most scarce material on the list and resale material is bringing prices above the producers' figures.

Nitrogen Solutions.—All the manufacturers are complaining of not getting sufficient nitrogen solutions, though within the last week some of the manufacturers in the west and around Baltimore have advised that the situation had become a little easier.

PHILADELPHIA

Markets More Active but Supplies Still Behind Demand. Improvement Shown in Deliveries of Superphosphate and Potash

Exclusive Correspondence to "The American Fertilizer"

PHILADELPHIA, October 25, 1948

The raw materials markets are a little more active, and while organics are a little easier in supply and price, chemicals continue in greater demand than supply and at higher prices than last season.

Sulphate of Ammonia.—The supply position shows no sign of improvement and is definitely unable to satisfy the demand. Producers' prices are well above last season, and resale material is much more scarce than hitherto, with infrequent offerings at $75.00 per ton.

Nitrate of Soda.—There is considerable demand for this article but any activity is limited principally to spot deliveries.

Ammonium Nitrate.—Some contract deliveries are reported behind schedule, and Canadian production has been reduced. Demand is far ahead of the supply. Odd lots of technical grade appear occasionally at premium prices.

Castor Pomace.—No offerings reported cur-

rently. Practically all production is under contract.

Blood, Tankage, Bone.—While blood is much firmer, tankage is slightly easier with sales at $7.25 ($8.82 to $9.12 per unit N), to $7.50 per unit of ammonia. Bone is definitely scarce for prompt and nearby shipment.

Fish Scrap.—Offerings are quite limited with only the feeding trade showing any interest. Sixty per cent protein menhaden meal was quoted at $129.00 per ton, with some scrap at $120.00.

Phosphate Rock.—Shipments are keeping up well with production and there is no great accumulation of stocks at the mines. High production costs keep the price firm.

Superphosphate.—The shipping situation shows some improvement and price has firmed up a little. Supply is fully adequate to meet the demand.

Potash.—Shipments continue to apply against contracts, with buyers still endeavoring to increase their commitments. Deliveries are said to be almost up to schedule, but the demand is still ahead of the supply.

CHICAGO

No Change in Organics Market. Buying Limited to Spot Materials. Better Supply of Vegetable Meals Expected

Exclusive Correspondence to "The American Fertilizer"

CHICAGO, October 25, 1948.

The animal ammoniates market in the middle west remains practically unchanged. Buying interest has been fairly good but in most instances trading is confined to material available for immediate shipment and quick turnover. Buyers are unwilling to take a chance on material for future shipment because of the anticipated heavy supply of vegetable proteins.

Meat scraps still range at $95.00 to $100.00 per ton and 60 per cent protein digester tankage $100.00 to $110.00 per ton, depending upon location. Dry rendered tankage varies in value from $1.60 to $1.70 per unit of protein, depending upon location and quality. Wet rendered tankage and dried blood is quoted $7.75 to $8.00 per unit of ammonia ($9.42 to $9.72 per unit N). Steamed bone meal is steady at $65.00 per ton for 65 per cent product and $60.00 to $65.00 per ton for raw bone meal testing 4½–45 per cent.

International Re-elects Directors and Officers

All directors of International Minerals & Chemical Corporation were re-elected at the annual meeting of the stockholders on October 26th, according to Louis Ware, president.

Following the formal proceedings of the meeting, stockholders were given an opportunity to become better acquainted with the company's food flavor accentuating product, Ac' cent, technically known as mono sodium glutumate. Mr. Ware commented upon the favorable developments of the Amino Products Division of the corporation and J. R. T. Bishop, vice-president in charge of that division, explained the manner in which a tasting demonstration would be given to the stockholders. Each stockholder was served a cup of oyster stew and separately a package of Ac' cent. After tasting the soup in the form in which it was served, stockholders then added Ac' cent to observe the manner in which the natural flavor of the food was brought out.

At a meeting on October 28th following the annual stockholders meeting, the directors re-elected all officers of the company.

Officers are: Louis Ware, president; James

P. Margeson, Jr., executive vice-president; Robert P. Resch, Vice-president and treasurer; Franklin Farley, vice-president in charge of phosphate division; Maurice H. Lockwood, vice-president in charge of plant food division; A. Norman Into, vice-president in charge of potash division; J. R. T. Bishop, vice-president in charge of amino products division; Dr. Paul D. V. Manning, vice-president in charge of research; Edward D. McDougal, Jr., general counsel and secretary; Edward Tubbs, comptroller; Stacy C. Thompson, assistant secretary; Carl F. Husen, assistant comptroller; and James A. Barr, chief engineer.

Potash Deliveries for Second Quarter Set Record

Record potash deliveries during the second quarter of 1948 in North America by the five major American potash producers and two importers totaled 517,502 tons of potash salts containing an equivalent of 278,952 tons of K_2O, the American Potash Institute has announced. This included European imports into the United States but not into Canada. It represented an increase of nine per cent in salts and seven per cent in K_2O over the tonnage delivered during the corresponding period in 1947. Deliveries for agricultural purposes in the United States, Canada, Cuba, Hawaii, and Puerto Rico (Institute countries) amounted to 480,260 tons of salts equivalent to 256,499 tons of K_2O, consisting of 226,000 tons as muriate, 11,432 tons as manure salts, and 19,066 tons as sulphate of potash and sulphate of potash-magnesia. Deliveries for chemical purposes amounted to 32,770 tons of salts, equivalent to 20,353 tons of K_2O. Exports to other than Institute countries totaled 2,100 tons K_2O.

During the first six months of 1948, total North American deliveries including imports amounted to 1,069,910 tons of salts containing an equivalent of 571,440 tons K_2O. This represented an increase of eight per cent in salts and seven per cent in K_2O over the same period in 1947. Deliveries of potash for agricultural use in Institute countries totaled 987,626 tons of salts with an equivalent of 520,519 tons of K_2O, an increase of seven per cent in salts and six per cent in K_2O over last year. Making up these agricultural deliveries were 449,892 tons K_2O as muriate, 32,030 tons K_2O as manure salts, and 38,597 tons K_2O as sulphate of potash and as sulphate of potash-magnesia. The chemical industries took 71,928 tons of potash salts containing an equivalent of 44,665 tons of K_2O, a 16 per cent increase over the first half of 1947. Exports to other than Institute countries amounted to 6,256 tons K_2O about three per cent under last year.

NORTH AMERICAN POTASH DELIVERIES
(Short Tons K_2O)

	Jan.–June 1948	Jan.–June 1947	April–June 1948	April–June 1947
Muriate	449,892	434,157	226,000	211,890
Manure Salts	32,030	21,606	11,432	8,756
Sulphate and Sul. Pot. Mag.	38,597	35,651	19,067	18,032
Total Agricultural	520,519	491,414	256,499	238,678
Chemical	44,665	38,439	20,353	19,553
Other Exports	6,256	6,427	2,100	1,364
Grand Total	571,440	536,280	278,952	259,595

Foreign Nitrogen Quotas Advanced to November 30th

Foreign governments which have been unable to place certified orders for purchase of their entire allocations of fertilizer nitrogen from the United States under the

International Emergency Food Committee program by October 31st were given an additional thirty days by the Office of Domestic Commerce on October 28th to place such orders for that portion of the allotments eligible for shipment after January 1, 1949.

Direction number 4A to allocation regulation number 2 required that certified orders for the entire allocation be played by October 31st and that at least 75 per cent of the order which commercial sources are called upon to supply must be shipped by January 1st. This is to make certain that exports will not unduly affect domestic fertilizer supplies during the months of heaviest demand in this country.

Because of financial difficulties some countries were unable to meet the October 31st deadline and faced a prospect of losing that part of the allocation remaining uncertified as of that date. In some cases this meant the loss of the entire allotment because no certified orders had been placed before the deadline. The amendment to direction number 4A, just announced by the ODC, makes no change in the basic requirement that 75 per cent of the allotment be shipped before January 1st but does make it possible for those countries to place certified orders for 25 per cent of the allotment for shipment after January 1st, if the orders are placed before November 30th.

Erosion Reduced by Fertilization

"Sheet Erosion" is the title of Bulletin 538 of the University of Vermont. Runoff losses from fertilized and unfertilized pastures were compared with losses from continuous corn on a 16 per cent slope of Melrose fine sandy loam. The original pasture cover consisted mainly of poverty grass and paintbrush. Treated with adequate lime and fertilizer in comparison with no fertilizer, the fertilized plots changed rather quickly from a poverty grass-paintbrush mixture to one predominantly bluegrass and white clover. For the three years of the experiment the average water loss in inches was 6.32 for continuous corn, 3.07 for unfertilized pasture, and 2.91 for fertilized pasture. Soil loss in pounds per acre was 29,532 for continuous corn, 37 for unfertilized pasture, and nothing for fertilized pasture. These plots were limed at the rate of 1,000 pounds per acre in the fall of 1938 and fertilized with 800 pounds per acre of an 8–20–12 mixture at seeding time, followed by a spring topdressing of 400 pounds per acre of an 8–24–8 mixture.

Pacific Chemical and Fertilizer Anniversary Booklet

In connection with their 58th anniversary, the Pacific Chemical and Fertilizer Company, of Honolulu, Territory of Hawaii, has issued an attractively lithographed booklet giving the story of "58 Years of Progress." The history of the company from its establishment in 1890 as the North Pacific Phosphate Company is traced briefly and full page illustrations of various plant operations give a well rounded picture of the company's facilities.

A very pleasing personal touch is given by the listing of the entire employee's roster, covering over two hundred names. In addition there are photographs, both individual and group, in which every worker, from President J. T. Phillips to Lizzie Akona, bag repair operator, is identified in the captions. As a method of cementing personnel pride and loyalty, the company has produced an effective piece of literature.

CLASSIFIED ADVERTISEMENTS

Phosphate Interests bought by Australia, New Zealand

The governments of Australia and New Zealand have bought the assets and interests of the Christmas Island Phosphate Company for £2,750,000. The two governments have appointed an authority to take over control of the property on December 31, and have announced that the phosphate produced will be distributed by the British Phosphate Commissioners.

Bemis Sewing Machine Clinics

Pictured below are scenes at two recent sewing machine "clinics" conducted by Bemis Bro. Bag Company for the benefit of plants which use bag-closing sewing machines. These clinics consist of lectures and demonstrations by experts on the adjustment and maintenance of the sewing heads used in closing filled bags.

In the top photograph, Al Rapp, Bemis sewing machine expert, lectures members of Associated Seed Growers, Inc., at San Antonio on the proper maintenance of their machines.

The photograph below shows L. S. Young Bemis Seattle representative, making an adjustment on a sewing head during a clinic held at the plant of Crown Mills in Portland, Oregon. In addition to Crown Mills men, representatives of the following firms attended: Pacific Supply Cooperative (Fertilizer Dept.), Terminal Flour Mills Company, Scott-Palitzsch Feed Mills, Hodgen-Brewster Centennial Flouring Mills Company, Dairy Cooperative Association (Feed Dept.), and the Great Western Malting Company.

The "faculty" included a representative of the Union Special Machine Company, and Bemis men from the Seattle and Vancouver plants.

Fertilizer Sales Increase

International Minerals and Chemical Corporation

Sales for International Minerals & Chemical Corporation during the first quarter of its fiscal year ending September 30 totaled $9,234,246, representing an increase of 11 per cent over the same quarter last year when sales were $8,303,108, according to Louis Ware, president.

At the same time, net earnings for the same fiscal quarter were $786,091 increasing from $360,990 during the comparable quarter last year. Mr. Ware called attention to the fact that the business of the company is seasonal and that first quarter operations should not necessarily be considered indicative of the annual trend.

Davison Chemical Corporation

Sales for the Davison Chemical Corporation during the three months ending September 27, 1948, amounted to $7,840,000, compared with $7,071,000 for the same period of 1947, according to an announcement by W. B. McCloskey, Controller.

Net earnings, after provision for income taxes, were $428,000, as compared with $593,000 for the same period of 1947.

The balance sheet as of September 27, 1948 shows current assets of $12,202,000 and current liabilities of $2,007,000, leaving net working capital of $10,195,000, a ratio of approximately six to one.

Potato Fertilization Practices Summarized

Potato production in the Northeast and North Central States is ably discussed in *U.S.D.A. Farmers' Bulletin No. 1958.* On the subject of fertilization we are told that fertilizing potatoes is a highly important practice in all late-crop sections. The importance of plant nutrients in potato production has been shown by numerous comparisons of fertilized and unfertilized plots, as well as by the experience of potato growers. The kind and amount of fertilizer required for successful potato production will depend to a considerable extent on the kind of soil and its state of fertility, on the available manure and its condition, and on the rotation practiced. The N-P-K ratio is important. No one ratio will fit all potato soils of the late-crop belt, but 1–2–1, 1–2–2, 1–2–3, 1–4–2, and 1–4–4 are the ones most widely recommended and used. Fertilizer analyses corresponding to these ratios are 5–10–5, 5–10–10, 4–8–12, 4–16–8, and 3–12–12 or 4–16–16. Rate of fertilization varies from one section to another, but the better growers use at least 1,200 pounds and from this amount up to 2,000 pounds with profit.

ST. REGIS SALES MEETING

(Continued from page 14)

new tonnage of kraft paper that St. Regis will have available in 1949 and suggested that this will make possible not only an extension of present markets enjoyed by the company, but will also permit an entry into many new markets. It will also permit, he added, an exploitation of what he described as border-line new markets, that is those in which some multiwall business has been developed but which have never been fully explored or pressed.

E. R. Gay, vice-president of St. Regis Paper Company and director of the company's Packaging Division, portrayed the part which management has played in aiding sales, stressing that acquisition of ample timberland resources, expansion in pulp and paper capacity and in engineering machine facilities and expenditures for research, sales promotion and advertising were all designed to give the salesman something to sell and to help in selling.

Mr. Gay referred to the development under way by the company of new types of bags, which he said should help entrench the company's position in many industries which it serves and aid in opening new markets.

One of the interesting panels of the meeting discussed the broad subject of new markets, sales-service and sales opportunities. Led by Kenneth D. Lozier, vice-president of St. Regis Sales Corporation, who directs sales promotion, advertising and publicity for the company, this discussion appraised the prospect and potential for multiwall bag business in a wide variety of commodities, some already substantially packed in multiwall bags, some only to a small degree and some so far packed in other types of containers.

It was clearly indicated that the company has set its sights on the huge feed market and that it now is prepared to push its packaging system (multiwall bags and automatic packers) into this field, not only on the basis of economy but also by laying stress on the sanitary aspects of paper as a container.

New markets in which the company anticipates important demand for its packers and multiwall bags, and for which it has developed special automatic packing equipment and bags, are in the citrus industry and in the important meat trimming field. Other commodities discussed in which the company looks for growing demand for multiwall bags as containers were carbon black, alfalfa meal, starch and powdered milk.

A high point of interest at the meeting was a panel discussion of technical developments in paper and bags, conducted by Carl H. Hartman, vice-president of St. Regis Sales Corporation, technical director for the division.

Many projects of interest to the sales' representatives were reported by this group. Of particular importance was the progress being made by St. Regis technicians in the utilization of synthetic resin coatings for kraft paper. These, according to Mr. Hartman, will improve the strength and performance of multiwall bags for specific uses and will be available at costs which will be fully competitive with other types of containers.

Robert P. Bushman, vice-president of the company's sales corporation, who heads the Engineering and Machine Division which designs and builds automatic filling equipment, conducted a panel discussion which developed for the gathering an important list of projects under way for the manufacture of new packing equipment for existing markets and as tools in opening up new markets.

FERTILIZER PROBLEMS

(Continued from page 9)

organics in mixed goods. The same period saw a gradual increase of the P_2O_5 content in phosphates and of K_2O in potassic salts. These newer, higher analysis materials have promoted the formulation of double-strenth goods. This trend to higher analysis will, it seems to me, continue because of the savings that can be effected. There is a limit, however, to the total amount of plant nutrients that can reasonably be reached. Mr. Jacob has suggested that in the southern states the level of the plant food in mixed goods attainable with present materials is about 21 to 24 per cent, an increase of from 1.5 to 4.5 per cent over the general average concentration existing in 194 . As the raw materials of the trade are refined in the process of concentrating them, some very valuable minor element constituents may be lost. As some problems are solved, new ones are introduced. Control chemists will be faced with newer problems when double-strength goods become more common.

Drillability

The drillability of mixed goods is of direct concern to the farmer and therefore to the manufacturer. When bulky organics were used generously in the compounding of fertilizers, it was no problem to secure good mechanical condition. The superintendent today has to use high-analysis nitrogenous carriers such as ammonium nitrate, in the form of solids and in ammoniacal solution. These and uramon materials have a strong tendency to absorb moisture. Despite this, he still has to maintain good mechanical condition. Granulation of fertilizers is one method of overcoming the drillability problem.

Micronutrients

I have previously referred to minor elements in fertilizer formulations. Fertilizers are now produced in many parts of the country to furnish boron to different crops. The quantity may be as high as 80 to 100 lbs. of borax per ton of fertilizer for application to alfalfa fields and from 5 to 25 lbs. for other crops such as beets and cauliflower. This development has brought with it new problems in chemical control as well as in manufacture. Methods of analysis for boron are not as well worked out and agreed upon by chemists as we would like to have them. Manganese, copper, zinc, and magnesium are other elements which are being added, most often in the form of sulphates, and their inclusion does not help to make control and production problems any easier. We would like to have rapid dependable methods of analysis for these elements. Recently one equipment manufacturer has put on the market a photoelectric filter photometer for making routine colorimetric analyses of copper, molybdenum and other elements.

In connection with these micronutrients we shall have to come to some general agreement regarding the method of reporting them. Some favor reporting them as the element, some prefer the oxide.

Corrective Measures

It is not possible nor desirable in a mixed meeting of this kind to go into details. I have tried to highlight the more important of the many problems we face. A fair question is, what are we doing about them?

I cannot speak for the industry. It is safe to say, however, that a great deal is being done, both by industry and control official laboratories, to solve these problems. Some of the work on sampling which is in progress was previously cited. Speaking for my own organization, I can say that we are doing and have done something about them. I have mentioned an advance in technology, namely, granulation, which goes far to overcome the problem of segregation and drillability. To my mind, granulation offers our industry a practical and economic method for preparing homogeneous, free flowing, non-segregating fertilizers. A number of fertilizer firms in this country, Canada, Great Britain, France and Italy are now employing this method.

My organization has a centralized, chemical control department. It keeps a complete record in tabulated form of all analytical results for each grade manufactured. It requires a daily sample of each grade or an average of one sample from each 200 tons batched and one sample from each 200 tons shipped. A serious effort is made to make a quick check into the causes for any deviation up or down, of the guaranteed analysis.

A project is now under way to study the characteristics of each type of mixing equipment used at our different plants and to determine how they may influence the quality of mixing. This will be a major project involving hundreds of chemical analyses and a careful appraisal by our engineers.

Other companies undoubtedly have similar studies in effect or proposed. These things are reported here to indicate that concrete action is being taken by industry to solve in a practical way the headache-producing types of problems.

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Commercial Solvents Corp., New York City
Spencer Chemical Co., Kansas City, Mo.

AMMONIUM NITRATE
Lion Oil Co., El Dorado, Ark.
Spencer Chemical Co., Kansas Cy, Mo.

BAG MANUFACTURERS—Burlap
Bemis Bros. Bag Co., St. Louis, Mo.
Chase Bag Co., Chicago, Ill.
Fulton Bag & Cotton Mills, Atlanta, Ga.
Virginia-Carolina Chemical Corp., Richmond, Va.

BAG MANUFACTURERS—Cotton
Bemis Bro. Bag Co., St. Louis, Mo.
Chase Bag Co., Chicago, Ill.
Fulton Bag & Cotton Mills, Atlanta, Ga.
Virginia-Carolina Chemical Corp., Richmond, Va.

BAG MANUFACTURERS—Paper
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St. Regis Paper Co., New York City
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BAG PRINTING MACHINES
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BAGGING MACHINES—For Filling Sacks
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BONE PRODUCTS
American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta. Ga.
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Baker & Bro., H. J., New York City
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McIver & Son, Alex. M., Charleston, S. C.
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BORAX AND BORIC ACID
American Potash and Chem. Corp., New York City

BROKERS
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Davidson Commission Co., The, Chicago, Ill.
Huber & Company, New York City
Jackle, Frank R., New York City.
Keim, Samuel D., Philadelphia, Pa.
McIver & Son, Alex. M., Charleston, S. C.
Schrock Fertilizer Service, Congerville, Ill.
Woodward & Dickerson, Inc., Philadelphia, Pa.

BUCKETS—For Hoists, Cranes, etc.
Hayward Company, The, New York City

BUCKETS—Elevator
Sackett & Sons Co., The A. J., Baltimore, Md.
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Atlanta Utility Works, The, East Point, Ga.
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Commercial Solvents Corp., New York City
Davison Chemical Corporation, Baltimore, Md.
Huber & Company, New York City
International Minerals & Chemical Corporation, Chicago Ill.
Lion Oil Company, El Dorado, Ark.
McIver & Son, Alex. M., Charleston, S. C.
Spencer Chemical Co., Kansas City, Mo.
Virginia-Carolina Chemical Corp., Richmond, Va.
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Keim, Samuel D., Philadelphia, Pa.

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Baker & Bro., H. J., New York City
Huber & Company, New York City
Jackle, Frank R., New York City.
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

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American Agricultural Chemical Co., New York City
Ashcraft-Wilkinson Co., Atlanta, Ga.
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Sturtevant Mill Company, Boston, Mass.
Titlestad Corporation, Nicolay, New York City

FERTILIZER (Mixed) MANUFACTURERS
American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Davison Chemical Corporation, Baltimore, Md.
International Minerals & Chemical Corporation, Chicago, Ill.
Southern States Phosphate & Fertilizer Co., Savannah Ga.
Virginia-Carolina Chemical Corp., Richmond, Va.

FISH SCRAP AND OIL
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Huber & Company, New York City
Jackle, Frank R., New York City.
McIver & Son Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

FOUNDERS AND MACHINISTS
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind

A Classified Index to Advertisers in "The American Fertilizer"

BUYERS' GUIDE

For an Alphabetical List of all the Advertisers, see page 33

HOPPERS
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Sturtevant Mill Company, Boston, Mass.

IMPORTERS, EXPORTERS
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Southern States Phosphate & Fertilizer Co., Savannah, Ga.
Woodward & Dickerson, Inc., Philadelphia, Pa.

INSECTICIDES
American Agricultural Chemical Co., New York City

LEAD BURNERS
Southern Lead Burning Co., Atlanta, Ga.

LIMESTONE
American Agricultural Chemical Co., New York City
Ashcraft-Wilkinson Co., Atlanta, Ga.
McIver & Son, Alex. M., Charleston, S. C.

LOADERS—Car and Wagon
Hough Co., The Frank G., Libertyville, Ill.
Sackett & Sons Co., The A. J., Baltimore, Md.

MACHINERY—Acid Making and Handling
Atlanta Utility Works, The, East Point, Ga.
Chemical Construction Corp., New York City
Monarch Mfg. Works, Inc., Philadelphia, Pa.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

MACHINERY—Ammoniating
Sackett & Sons Co., The A. J., Baltimore, Md.
Sturtevant Mill Company, Boston, Mass.

MACHINERY—Elevating and Conveying
Atlanta Utility Works, The, East Point, Ga.
Hough Co., The Frank G., Libertyville, Ill.
Hayward Company, The, New York City
Link-Belt Co., Chicago, Ill.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Sturtevant Mill Company, Boston, Mass.

MACHINERY—Grinding and Pulverizing
Atlanta Utility Works, The, East Point, Ga.
Bradley Pulverizer Co., Allentown, Pa.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Sturtevant Mill Company, Boston, Mass.

MACHINERY—Material Handling
Atlanta Utility Works, The, East Point, Ga.
Hayward Company, The, New York City
Hough Co., The Frank G., Libertyville, Ill.
Link-Belt Co., Chicago, Ill.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Sturtevant Mill Company, Boston, Mass.

MACHINERY—Mixing, Screening and Bagging
Atlanta Utility Works, The, East Point, Ga.
Link-Belt Co., Chicago, Ill.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Sturtevant Mill Company, Boston, Mass.

MACHINERY—Power Transmission
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

MACHINERY—Superphosphate Manufacturing
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Sturtevant Mill Company, Boston, Mass.

MANGANESE SULPHATE
McIver & Son, Alex. M., Charleston, S. C.

MINOR ELEMENTS
Tennessee Corporation, Atlanta, Ga

MIXERS
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Sturtevant Mill Company, Boston, Mass.

NITRATE OF SODA
American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Huber & Company, New York City
International Minerals & Chemical Corporation, Chicago, Il.
McIver & Son, Alex. M., Charleston, S. C.

NITROGEN SOLUTIONS
Lion Oil Company, El Dorado, Ark.
Spencer Chemical Co., Kansas City, Mo.

NITROGENOUS ORGANIC MATERIAL
American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J. New York City
Davidson Commission Co., The, Chicago, Ill.
Huber & Company, New York City
International Minerals & Chemical Corporation, Chicago, Ill
Jackle, Frank R., New York City.
Maryland Drying Mach. Co., Baltimore, Md.
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

NOZZLES—Spray
Monarch Mfg. Works, Philadelphia, Pa.

PHOSPHATE ROCK
American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Huber & Company, New York City
International Minerals & Chemical Corporation, Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Virginia-Carolina Chemical Corp., Richmond, Va.

PLANT CONSTRUCTION—Fertilizer and Acid
Atlanta Utility Works, The, East Point, Ga.
Chemical Construction Corp., New York City
Monsanto Chemical Co., St. Louis, Mo.
Sackett & Sons Co., The A. J., Baltimore, Md.
Southern Lead Burning Co., Atlanta, Ga.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Sturtevant Mill Company, Boston, Mass.
Titlestad Corporation, Nicolay, New York City

POTASH SALTS—Dealers and Brokers
American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Huber & Company, New York City
International Minerals & Chemical Corporation, Chicago, Ill.
Jackle, Frank R., New York City.

POTASH SALTS—Manufacturers
American Potash and Chem. Corp., New York City
Potash Co. of America, New York City
International Minerals & Chemical Corporation, Chicago, Ill.
United States Potash Co., New York City

PRINTING PRESSES—Bag
Schmutz Mfg. Co., Louisville, Ky.

PYRITES—Brokers
Ashcraft-Wilkinson Co., Atlanta, Ga.

REPAIR PARTS AND CASTINGS
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

BUYERS' GUIDE

SCALES—Including Automatic Bagging
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

SCREENS
Atlanta Utility Works, The, East Point, Ga.
Link-Belt Co., Chicago, Ill.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Sturtevant Mill Company, Boston, Mass.

SEPARATORS—Air
Kent Mill Co., Brooklyn, N. Y.
Sackett & Sons Co., The A. J., Baltimore, Md.
Sturtevant Mill Co., Boston, Mass.

SPRAYS—Acid Chambers
Monarch Mfg. Works, Inc., Philadelphia, Pa.

SULPHATE OF AMMONIA
American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Huber & Company, New York City
Jackle, Frank R., New York City.
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

SULPHUR
Ashcraft-Wilkinson Co., Atlanta, Ga.

SULPHURIC ACID
American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Huber & Company, New York City
International Minerals & Chemical Corporation, Chicaro, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Southern States Phosphate Fertilizer Co., Savannah, Ga.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Virginia-Carolina Chemical Corp., Richmond, Va.

SUPERPHOSPHATE
American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Davison Chemical Corporation, Baltimore, Md.
Huber & Company, New York City
International Minerals & Chemical Corporation, Chicago, Ill.
Jackle, Frank R., New York City.
Southern States Phosphate Fertilizer Co., Savannah, Ga.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Virginia-Carolina Chemical Corp., Richmond, Va.

SUPERPHOSPHATE—Concentrated
Armour Fertilizer Works, Atlanta, Ga.
International Minerals & Chemical Corporation, Chicago, Ill.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Virginia-Carolina Chemical Corp., Richmond, Va.

TAGS
Keener Mfg. Co., Lancaster, Pa.

TANKAGE
American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Davidson Commission Co., The, Chicago, Ill.
International Minerals & Chemical Corporation, Chicago, Ill.
Jackle, Frank R., New York City.
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

VALVES
Atlanta Utility Works, The, East Point, Ga.
Monarch Mfg. Works, Inc., Philadelphia, Pa.

Alphabetical List of Advertisers

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1. Quality . . . our Red Indian products are of unquestioned excellence.
2. Service . . . we make every effort to give you the service you want and deserve.

When better service is possible be assured P. C. A. will give it. Meanwhile your confidence, and your patience are greatly appreciated.

POTASH COMPANY OF AMERICA

CARLSBAD, NEW MEXICO

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SOUTHERN SALES OFFICE . . Candler Building, Atlanta, Ga.

Many Farmers Now Want Fertilizers Containing Both Potash and Magnesia

as Supplied in

Sul-Po-Mag

Water-Soluble

Double Sulfate of Potash-Magnesia

SUL-PO-MAG TRADEMARK REG. U. S. PAT. OFF.

Rapidly increasing numbers of farmers are finding it profitable to use fertilizers containing soluble magnesia and potash in combination with other plant foods.

Experience shows that where there is a lack of balance in the magnesium content of their soils, they are obtaining earlier maturity, higher yields, improved quality crops and increased acre values by the use of *Sul-Po-Mag*.

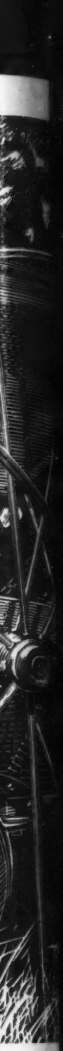
You can supply soluble magnesia in the most practical and convenient form by using *Sul-Po-Mag* in your fertilizer mixtures or for direct application.

Sul-Po-Mag is a properly balanced combination of magnesium and potash formed by nature in the mineral langbeinite, mined and refined exclusively by International at its mines at Carlsbad, New Mexico. Both the magnesium and potash are in water-soluble form and are quickly available to crops.

You will find in *Sul-Po-Mag* the same free-flowing, easy-handling qualities which have made International Sulfate and Muriate of Potash the choice of so many fertilizer manufacturers. *Potash Division, International Minerals & Chemical Corporation. General Offices: 20 North Wacker Drive, Chicago 6.*

SUL-PO-MAG (Water-Soluble Double Sulfate of Potash-Magnesia)
MURIATE OF POTASH • SULFATE OF POTASH

MINERALS *International* CHEMICALS



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